Documentation Sheet

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Title *Multi-beam Planar Antenna Array: Active Cancellation of Uncorrelated Probing using Modified Improved LMS Algorithm*

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Abstract

The motivation of the present study is to analyze the suppression capabilities of planar antenna arrays when mounted on any aerospace platform or base station. It is expected to maintain sufficient gain towards the desired directions (single or multiple) and nullify the undesired ones at the same time without any distortion in the original pattern of the antenna array. This requires an efficient adaptive algorithm for the weight estimation used to gain the antenna elements. If there is minimum transmitted energy towards the undesired directions or the hostile sources attempting to probe the antenna then it leads to the active RCS reduction of the antenna towards the probing direction.

In this report, study on capability of planar (rectangular cross section) antenna array is carried out for the signal environment consisting of multiple desired signals and uncorrelated probing sources. Modified Improved LMS algorithm is used for calculating weights in such signal scenario so as to minimize the output noise power and enhance the detection of desired signals even in the presence of multiple probing sources. The performance of planar antenna array in terms of response time for the generation of adapted pattern is analyzed for different number of desired radar sources and sources attempting to probe the antenna array. Further the capability of the planar antenna array is investigated for the signal environment consisting of overlap of the desired and probing source directions.